



BRISBANE NEW PARALLEL RUNWAY WORKS

SUBMISSION 1

STATEMENT OF EVIDENCE
TO THE
PARLIAMENTARY STANDING COMMITTEE
ON PUBLIC WORKS

AIRSERVICES AUSTRALIA
CANBERRA ACT
SEPTEMBER 2017

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1. Program Title

Brisbane New Parallel Runway Program.

2. Introduction

Airservices Australia (Airservices) is a Government-owned organisation responsible under the *Air Services Act 1995* (the Act) for providing safe, secure, efficient and environmentally responsible services to the aviation industry. We provide the aviation industry with telecommunications, aeronautical data, navigation services and aviation rescue fire fighting services (ARFFS).

We provide these services from two major centres in Melbourne and Brisbane, two terminal control units (TCUs), 29 air traffic control towers at international and regional airports, and ARFFS at 26 of the nation's busiest airports. In addition to this, Airservices maintains a range of aviation navigation and surveillance equipment around the country. We have a fixed asset base of over 1000 buildings at 684 sites around Australia valued at over \$1 billion. We safely manage 11 per cent of the world's airspace where there are more than four million aircraft movements carrying more than 152 million passengers annually.

Airservices does not receive any appropriations from the Government. Our revenue is derived from provision of services for air traffic control (ATC) and ARFFS. This revenue funds our operating expenses and our investment in capital works and other projects on behalf of the Australian Government and the aviation industry.

We liaise directly with our airline customers in negotiating our Long Term Pricing Agreement (LTPA) which is endorsed by the Australian Competition and Consumer Commission (ACCC) and monitored by industry stakeholders through a Pricing Consultative Committee (PCC).

2.1 Context

Forecasts for aviation traffic growth indicate passenger numbers in our region will double by 2030. Brisbane Airport is one of Australia's fastest growing airports and is recognised as a key driver in the long-term growth of the Queensland and Australian economies. The number of passengers through Brisbane Airport is expected to increase from 22.7 million passengers in 2016-17 to around 50 million by 2035. The airport currently has a main runway, a cross runway, international and domestic aprons, and associated taxiways. The existing runway system at Brisbane Airport has a peak capacity of 50-60 aircraft movements per hour which is not expected to meet future demand.

In 2007, the Federal Minister for Transport and Regional Services approved Brisbane Airport Corporation's (BAC) major development plan for the provision of a New Parallel Runway (NPR) at Brisbane Airport to help meet future air traffic demand. The new runway will be located two kilometres west of and parallel to the current 01/19 runway and is expected to commence operations in 2020.

BAC is currently in the process of constructing the NPR which will enable it to operate two parallel runways capable of delivering simultaneous opposite direction operations. The existing cross runway 14/32 will be decommissioned. The parallel runways will manage up to Code F aircraft (up to and including an Airbus A380).

2.2 Purpose

To install supporting aviation infrastructure and equipment to enable the operation of Brisbane's NPR.

3. Need for the Works

3.1 Identified Need

New ANS and ARFFS infrastructure and technology is required to support the introduction of the Brisbane NPR as outlined below.

The introduction of the NPR requires Airservices to install additional airfield equipment and infrastructure, including navigation aids at each end of the NPR. A second Surface Movement Radar (SMR) and additional multilateration system (MLAT) remote units are required to be installed in the existing Advanced Surface Movement Guidance and Control System (ASMGCS). The existing communications network will be unable to support the additional infrastructure and a new fibre optic network is required. While these systems and equipment do not meet the definition of a public work¹, the civil works required for their installation do and, together with the new ARFFS station, are the subject of this submission.

A new ARFFS station is also required to support the NPR as the current ARFFS stations will not meet the regulatory requirements under Civil Aviation Safety Regulation (CASR) Part 139 and the Manual of Standards (MOS) Part 139 H. These requirements specify criteria, including those for determining the location of an ARFFS facility. For example, ARFFS is required to achieve a response time (the time between the initial call and when the first responding vehicle is in position at an incident) to the end of each runway not exceeding three minutes in optimum visibility and surface conditions. This regulatory requirement constrains where an ARFFS facility can be located.

Currently, ARFFS is provided from both a main and satellite fire station on the airport to meet these regulatory requirements. The satellite fire station that primarily services the crossing runway will be decommissioned after the NPR becomes operational as it will not meet the criteria to service the NPR. The establishment of a new fire station is therefore required to service the NPR and will also need to meet other regulatory criteria, including line of sight requirements.

The proposed works will enable continued delivery of safe and secure movement of people, freight and aircraft through Brisbane Airport.

3.2 Options considered to meet the identified need

Air navigation equipment

Civil works are required to prepare sites for the installation of new air navigation aids and the final segments of a fibre optic ring to provide communications. The options for the siting of the civil works required for the installation of the proposed airfield navigation equipment are limited by the requirements of the equipment such as line of sight, proximity, obstacle clearance, critical clear areas, cabling and coverage. The preferred siting is based on these limitations and requirements.

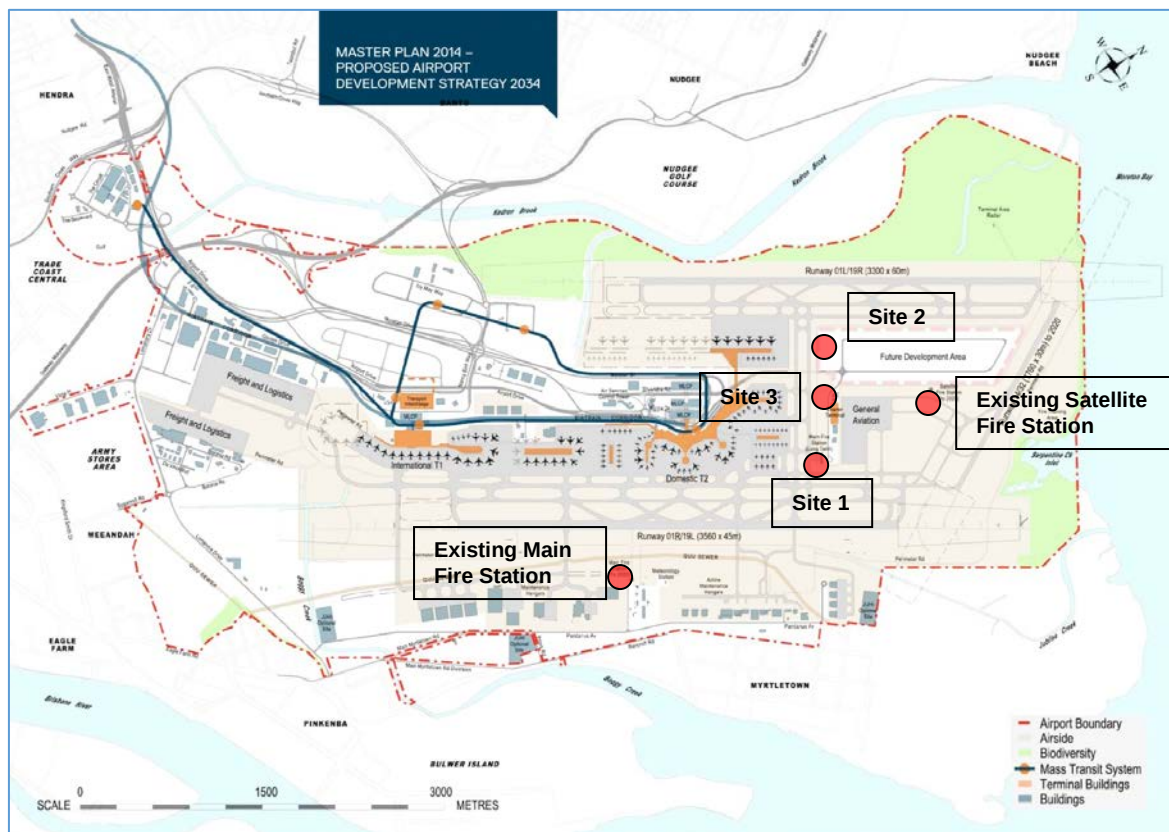
ARFFS Station

Airservices commissioned aviation consultants Airbiz to undertake an options analysis to determine the optimal location for an ARFFS station from several locations that were available to Airservices. Following this the preferred option, including site location, was agreed by both Airservices and BAC. Options considered to enable Airservices to provide services to the new runway which are compliant with the legislation are summarised below. Figure 1 shows the site location for each option. The Airbiz

¹ The installation of the air navigation equipment is not designed to be used in, or in relation to, the provision of services for a building or other structure. These works are being installed to enable the safe operation of aircraft to and from an airport (see PWC Procedures Manual, section 1.36).

1. **New single Category 10 Facility at Site 1** – This option included the establishment of a single, large, facility at Site 1 which would provide services up to an ARFFS Category 10. This option would provide a service to the entire airport from a single facility, and include the decommissioning and demolition of both existing facilities (Station East and the Satellite Station).

Figure 1: ARFFS station options for Brisbane Airport NPR



2. **New Fire Station at Site 2** – While this site provides compliant visibility and response times to an incident on the NPR, the geotechnical conditions are poor which would result in a much longer construction period and a substantially higher site preparation cost. As with the preferred option, this option would require the continued use of the existing Station East to provide visibility and initial response to the existing runway.

This was the most expensive option considered due to the existing geotechnical conditions. It also involved a high risk of failure to deliver within the specified timeframes for the NPR due to the geotechnical conditions which were estimated to require a 24 month settlement period prior to commencement of construction. As a result, this option was discounted.

3. **Upgrade of the Existing Satellite Station** – This option would require a significant upgrade to the existing Satellite Station to provide compliant visibility and initial response to the NPR. The existing facility would need to be enlarged and a new road constructed to provide access to the taxiways associated with the NPR.

This option was discounted due to its inability to meet the value for money principle, given the requirement to build a substantial access road in difficult geotechnical conditions.

4. **New Fire Station at Site 3 (Preferred Option)** – The preferred option requires the construction of a new facility at Site 3 to provide compliant sight lines and initial response to the NPR. The existing Station East will continue to be used to provide visibility and initial response to the existing runway. The existing Satellite Station will be decommissioned, demolished, and the site remediated.

3.3 Reasons for Adopting Preferred Options

Air navigation equipment

Surface Movement Radar

To gain visibility of all vehicle movements on the aerodrome, the location of the surface movement radar is based upon line of sight encompassing of the new parallel runway and associated taxiways.

Instrument Landing System (ILS) and Distance Measuring Equipment (DME)

The selection criteria for the location of the ILS and DME is based upon the location of the runway threshold and centre line.

Additional Frequencies

The selection criteria for the location of the additional frequencies is based upon optimal radio coverage analysis.

Fibre Optic Network

The location of the final segments of pits and ducts to be provided by Airservices is determined by the path of the connection points to Airservices facilities.

ARFFS station (New fire station at Site 3)

This site was selected as the preferred option as it provides the optimal location and favourable geotechnical conditions. Establishing a new fire station at Site 3 will allow Airservices to meet the regulatory requirements of Civil Aviation Safety Regulation (CASR) Part 139 and the Manual of Standards (MOS) Part 139H. It has the lowest operational risk to the provision of a compliant service and is the most cost-effective solution.

4. Scope of Works

4.1 Program Scope

The scope of the public works component of the Program includes:

Air navigation equipment²

- a. Civil works supporting the installation of new navigation aids: two new Instrument Landing Systems (ILS), Distance Measuring Equipment (DME) and Anemometers servicing each end of the new runway

² Note: Airservices' proposed program of works includes infrastructure and equipment which are outside the definition of a public work. In Section 4.1 paragraphs a, b, and c, only the civil works component meets the definition of a public work.

- b. Civil works supporting the provision, installation and integration of a second Surface Movement Radar (SMR) and additional Multilateration System (MLAT) remote units into the existing Advanced Surface Movement Guidance and Control System (ASMGCS)
- c. Civil works supporting the provision of an Airservices on airport fibre network communications infrastructure including:
 - Dryandra Road Early Works – provision of new fibre optic cabling to replace the existing fibre optic cabling between the ATSC OMER and the satellite fire station site boundary due to the impact of BAC Dryandra road bypass works, and
 - New runway fibre ring – provision of a new fibre ring to permit the operation of the new navigation, surveillance and communications equipment and support the future replacement of the current airport fibre ring

ARFFS station

- d. Construction of a new ARFFS Station comprising of the following:
 - Establishment of a sub-lease over a new parcel of land for the new ARFFS facility
 - Design of new facilities based on the Airservices Standardised Design documentation and site specific room data sheets
 - Construction of new facilities, including:
 - o tender bays – sized to suit three Rosenbauer Panther ultra large fire vehicles and one domestic response vehicle
 - o administration and amenities building
 - o vehicle replenishment facilities
 - Transition and commissioning of ARFFS to the new facilities
- e. Decommissioning, demolition, removal from site, and remediation of the existing Satellite Station.

Existing infrastructure (other than the Satellite Station) will remain in operation and continue to provide compliant services to the existing runway. The addition of these new supporting infrastructures and resources will ensure continuity of a compliant service to all Brisbane Airport operations.

4.2 Program Location

The proposed location of the new facilities will be at the existing Brisbane Airport on the sites identified in Figures 2 and 3.

Figure 2: Proposed location for the new airfield navigation equipment services and infrastructure

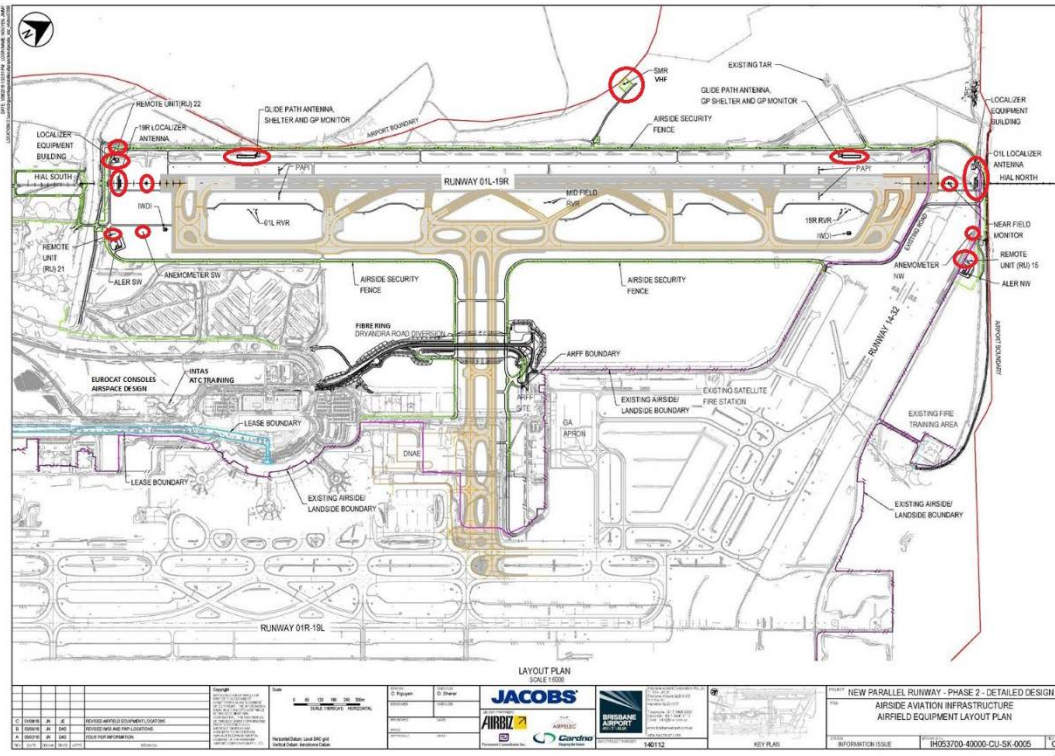
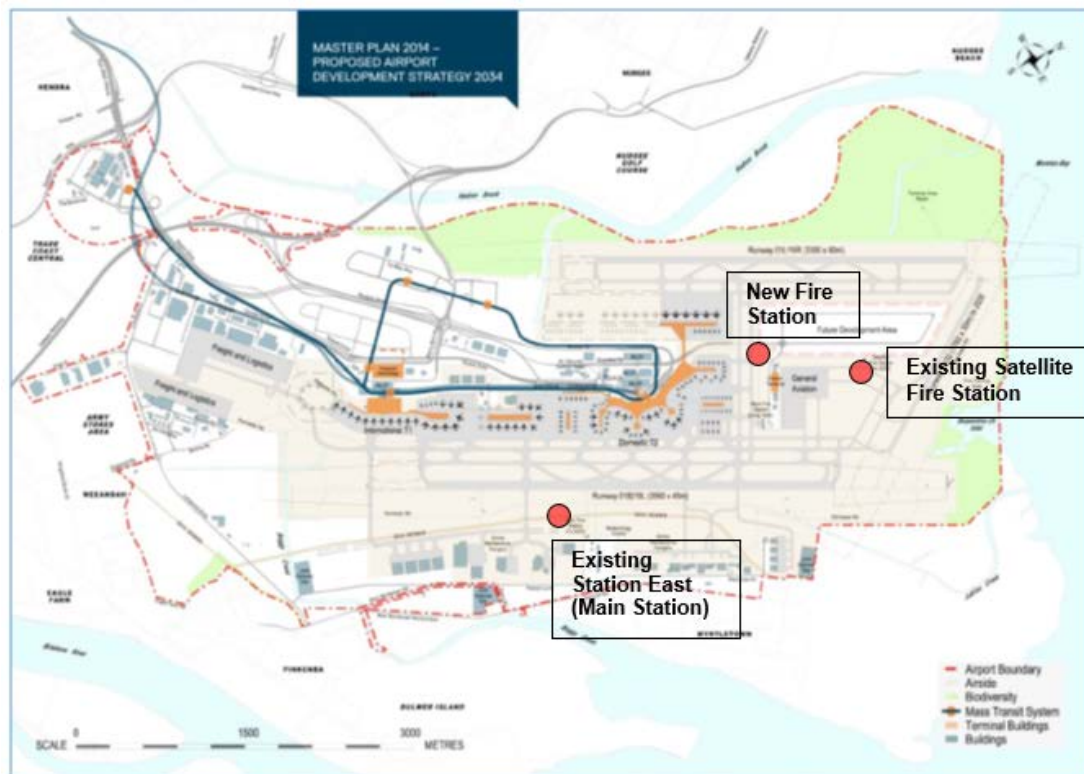


Figure 3: Existing and proposed ARFFS facilities at Brisbane Airport



4.3 Related Works

Airservices' proposed program of works includes the installation of airfield infrastructure and equipment (including navigation aids and radar) which are outside the definition of a public work. As part of this submission, Airservices is seeking Committee approval for the civil works required for the installation of these supporting navigation aids and the fibre optic network (Refer to paragraphs a, b, and c of the Program Scope). Following the completion of the civil works, the installation of this supporting infrastructure and equipment will occur.

4.4 Environmental Impact Assessment

The NPR proposal activated two major pieces of Commonwealth legislation – the *Airports Act 1996* (Airports Act) and the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

To fulfil the requirements of both Acts, BAC developed a four volume combined Major Development Plan (MDP) under the Airports Act and Environmental Impact Statement (EIS) under the EPBC Act for consultation with the public. The installation of airfield infrastructure and equipment and the construction of a new fire station were identified as required works associated with the NPR in the combined MDP / EIS.

The combined MDP / EIS was approved by the Australian Government on 18 September 2007. The approval conditions required BAC to meet a number of environmental conditions, including the preparation and implementation of a Construction Environmental Management Plan (CEMP), which would include mitigation options to address any potential contamination, to be approved by the Government-appointed Airport Environment Officer.

The installation of Airservices facilities on the NPR is subject to the requirements of the MDP / EIS and the CEMP. Contamination testing is undertaken prior to commencement for all construction projects in accordance with Airservices' Environment Management System and relevant legislation and guidance. All site assessments undertaken by Airservices or its contractors must be consistent with the requirements of the *National Environment Protection (Assessment of Site Contamination) Measure 1999* (NEPM), and where necessary, the *Managing Perfluorinated Compound (PFC) Contamination at Airports 2015* framework, and the Guideline for Environmental Management (GEM): *PFC Management Actions Advice*.

A baseline environmental contamination survey for the project will be completed in late 2018. A detailed contamination analysis of the Satellite ARFFS Station will also be completed as part of these works. Environmental management will be delivered on this project through regular environmental site inspections and improvement plans.

4.5 Heritage Considerations

The installation of Airservices facilities on the NPR is subject to the BAC MDP / EIS, which addressed the potential for impact of the NPR on cultural heritage. The impact of these works on cultural heritage has been assessed as negligible.

4.6 Impact on Local Community

Consultation in relation to public works undertaken as part of the new NPR is managed by BAC. An extensive community engagement and consultation program was undertaken as part of the MDP / EIS process, followed by a 90-day public comment period. BAC addressed all comments received during the three month public comment period in a supplementary report, which formed part of the Final EIS submitted to the Australian Government for approval.

Adverse community impacts of this supporting infrastructure program are assessed as negligible. A beneficial impact is the generation of temporary employment opportunities for construction and building contractors to support the project.

Airservices has undertaken similar programs in the past and will utilise that experience to ensure that the completion of the work is appropriately monitored and managed. Tender documents will give consideration to the *Workplace Gender Equality Act 2012*, the Building Code 2016, the Federal Safety Commission Workplace Health & Safety (WHS) Scheme and other relevant legislation.

4.7 Site Description

The sites of the proposed infrastructure are on reclaimed and cleared land around the NPR. The sites have been covered with sand by BAC as part of the site preparation works for the NPR and associated taxiways, access ways and perimeter roads. Figures 2 and 3 indicate the locations of the proposed air navigation equipment and ARFFS station works.

4.8 Zoning and Approvals

The sites identified for these programs are contained within the BAC lease and are in accordance with the airport's Master Plan. The Airport Building Controller is the approvals authority for this development. Due to the early stage of the programs, approvals have not yet been sought. Based on the current program timeline, it is anticipated these will be sought throughout 2018.

4.9 Land Acquisition

The land these facilities will be built on will be leased or licensed from BAC. No additional land will need to be acquired for the completion of this program.

4.10 Applicable Codes and Standards

The design of the proposed facilities will conform to the relevant sections of the National Construction Code 2016 (Building Code of Australia 2016) and relevant current Australian Standards and Codes.

4.11 Program Planning and Design Concepts

The Airservices Standardised Design for the new infrastructure, and subsequent site specific amendments made for this program, incorporate the following considerations:

- a. location and layout to comply with CASR MOS Part 139H visibility and response time requirements
- b. optimal system performance
- c. consideration and implementation of best available and appropriate Workplace Health & Safety (WHS) design features
- d. consideration and implementation of best available and appropriate workplace design and amenity
- e. consideration and implementation of concepts that minimise the long term maintenance and upgrade of plant and major building components
- f. durability and maintainability in terms of low life cycle costing
- g. environmental sustainable design.

The Civil Works Plan (SK30) at Attachment B provides a concept of how the required ARFFS facilities will be laid out on the site. The concept depicted in SK30 is based on the recent development of a new facility at Hamilton Island, however the Brisbane facility will be significantly larger and this design

concept will be adapted to suit the site specific requirements. As part of the detailed design development Airservices will further develop this site layout to minimise the footprint required and optimise the flow of fire vehicles through the site.

4.12 Acoustics

Where necessary, the ARFFS facilities will include an appropriate level of acoustic treatment consistent with the provision of a suitable working environment on an operational airfield.

4.13 Energy Conservation Measures

The facilities, where necessary, will be designed to achieve a 4.5 star Ecologically Sustainable Development (ESD) rating. Once a detailed design is complete, a life cycle cost analysis will be completed for the new ARFFS station design to ensure the delivery of an efficient station.

4.14 Planning and Site Planning Considerations

The need for new facilities was anticipated and included in the approved BAC MDP for the airport. The MDP ensures that development on a federally leased airport is consistent with the airport's Master Plan, which covers matters such as land use plans, permitted developments and noise and environmental impacts.

4.15 Provisions for People with Disabilities

Access for people with disabilities at the new ARFFS facility (including disabled toilets and wheelchair ramps to the main entrance) is provided on the ground floor of the facility. Should a second floor be required, Airservices believes it complies with the requirements of the Disability Discrimination Act 1992 without providing lift access to the first floor of the facility due to the operational nature of the first floor.

The ARFFS facility will use a standardised design that has been used for similar Airservices programs. These designs incorporated disabled access to the ground floor only and have been approved by the relevant building authorities at several airports across Australia. The design will be completed in accordance with AS1428.1 Design for Access and Mobility and the National Construction Code (NCC). A Building Surveyor will be engaged to assess compliance with the *Disability Discrimination Act 1992* requirements during the design development process.

4.16 Child-Care Provisions

Child care facilities are not included within the proposed facilities, as these facilities are operational and 'airside'.

4.17 Fire Protection and Security Measures

Fire protection will be designed in accordance with NCC / BCA requirements.

Airservices' internal security section is responsible for all aspects of security within Airservices. The *Aviation Transport Security Act 2004* provides a framework for the security of Airport facilities. The facilities will be designed to comply with these requirements.

4.18 Landscaping

The scope of the programs includes landscaping, where applicable and required, to be consistent with the landscaping requirements specified by BAC.

4.19 Consultation with Authorities

Extensive consultation has been undertaken with BAC on the location, size, and visual aspects of the new facilities. Due to the facilities being located on land leased by BAC and remote from any public developments, no public consultation has been undertaken by Airservices.

4.20 Public Impacts

The programs will establish infrastructure within areas prepared by BAC for the specific purpose of delivering a new parallel runway. As noted above, these facilities are located on BAC land within the boundary of the airport. As a result it is not anticipated that the proposed development will have any adverse impacts on the public.

5. Project Cost, Timeframe and Public Value

5.1 Project Budget

The overall budget of the proposed works is estimated at \$24.92 million (excluding Goods and Services Tax). The budget incorporates all construction and consultant costs, internal labour, equipment and travel. A detailed breakdown of the cost elements is provided in the confidential cost estimate submitted separately at Submission 1.1.

5.2 Project Delivery System

The Project will be delivered through a number of external contractors managed by Airservices. The major contractor activities are:

- a. Concept Design – preparation of a concept design to document a lease boundary and an initial layout of facilities within the site
- b. Surcharge Design – due to the geotechnical conditions, the site will need to be consolidated for an anticipated period of 12 months prior to the commencement of construction. This will be delivered by BAC, as will the site investigations, including geotechnical, topographical, environmental and heritage studies
- c. Surcharge Placement and Removal – (this will be delivered by BAC). A civil contractor will be engaged to place surcharging material on the site in accordance with the Surcharge Design. Once the consolidation period is complete the surcharge will be removed from the site.
- d. Detail Design – development of detailed design documents to support the construction of the facilities
- e. Construction – building contractors will be engaged to complete the construction of the new facilities, including the demolition of the existing ARFFS Satellite Station once the new facilities are operational.

5.3 Construction Program

The project is scheduled to be completed in line with the new runway being operational in July 2020. All infrastructure will be operational from this date with project closure to be achieved within three months after the operational service date.

5.4 Revenue

The project is funded as part of Airservices' approved capital works program. Airservices charges airlines and aircraft operators for the use of its services and this revenue funds its capital expenditure requirements. Charges levied are subject to extensive consultation with these customers and are

regulated by the Australian Competition and Consumer Commission (ACCC) under the Prices Surveillance sections of the *Competition and Consumer Act 2010*.

5.5 Public Value

Public value through the expanded services and infrastructure will be realised by:

- a. supporting BAC to increase the capacity of Brisbane Airport through the implementation of a parallel runway at the airport in 2020.
- b. providing infrastructure and training to ensure Airservices continues to facilitate the efficient, safe and secure movement of people, freight and aircraft through Brisbane Airport.

A range of consultants, contractors and construction workers will be required to deliver the program of works.

6. Attachments

Attachment A – Brisbane NPR ARFFS Assessment Update Airbiz Report

Attachment B – Brisbane NPR ARFFS Civil Works Plan

Acronyms

Acronym	Description
ABC	Airport Building Controller
ACCC	Australian Competition and Consumer Commission
AEO	Airport Environment Officer
Airports Act	The Airports Act 1996
ANS	Air Navigation Services
ARFFS	Aviation Rescue Fire Fighting Service
ASMGCS	Advanced Surface Movement Guidance and Control System
ATC	Air Traffic Control
ATIS	Aerodrome Terminal Information Service
ATM	Air Traffic Management
ATSC	Air Traffic Services Centre
BAC	Brisbane Airport Corporation
BCA	Building Code of Australia
CASA	Civil Aviation Safety Authority
CASA MOS 139H	Civil Aviation Safety Authority Manual of Standards Part 139H
CASR	Civil Aviation Safety Regulations
DME	Distance Measuring Equipment
EIS	Environmental Impact Statement
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
ESD	Ecologically Sustainable Development
ILS	Instrument Landing System
INTAS	Integrated Tower Automation Suite
LTPA	Long Term Pricing Agreement
MDP	Major Development Plan
MLAT	Multilateration System
MOS	Manual of Standards
NCC	National Construction Code
NPR	New Parallel Runway
OMER	Operations Meteorological Equipment Room
SMR	Surface Movement Radar
TCU	Terminal Control Unit
VCS	Voice Control Switch
VHF	Very High Frequency
WHS	Workplace Health & Safety



BRISBANE AIRPORT ARFFS ASSESSMENT UPDATE ALTERNATIVE SITES - NEW PARALLEL RUNWAY

15 JUNE 2015

DRAFT



ARFF ASSESSMENT CONTENTS

1. Introduction
2. Airport Master Plan Update - 2034
3. Proposed ARFF Sites
4. Typical ARFF Station Design
5. Response Time and Line of Sight Criteria
6. Vehicle Performance Standards and Assumptions
7. Response Time Analysis
8. FCC Viewing Tower Sight Lines
9. Obstacle Limitation Surfaces (OLS) Impact
10. Existing Control Tower Sight Lines
11. Airside / Landside Access and Utility Services
12. Conclusion and Recommendation

ARFF ASSESSMENT INTRODUCTION

Brisbane Airport is currently constructing a New Parallel Runway (NPR) designated as 01L-19R .

Airservices commissioned Airbiz in June 2014 to undertake an assessment in order to determine the optimal number and locations of fire station(s) for the provision of ARFF services.

The preferred site from the assessment was in a location which was not available for the day of opening of the new runway due to the time required to surcharge the land.

This updated report investigates new alternative sites for consideration.

ARFF ASSESSMENT INTRODUCTION

The assessment will need to meet ICAO standards and CASA regulatory requirements as well as the Guiding Principles for New ARFF Fire Stations as provided by Airservices.

In addition to response time requirements which are described in more detail below, the following Guiding Principles are to be applied:

Number of Fire Stations Required

The preference is to provide the ARFF service from a single Fire Station at small and medium size airports. However, at larger airports with multiple runways, a zonal coverage model with multiple fire stations should be provided whenever the response time cannot be achieved from a single fire station. This should consider the following:

- *Local topography (e.g. ability to meet response times)*
- *Complexity of airside operations and volume of air traffic (e.g. issues that may delay response from Fire Station/s or delay ARFF vehicles enroute to incident site)*

Siting (location) of the Fire Station(s)

The location (siting) of the Fire Station(s) should consider:

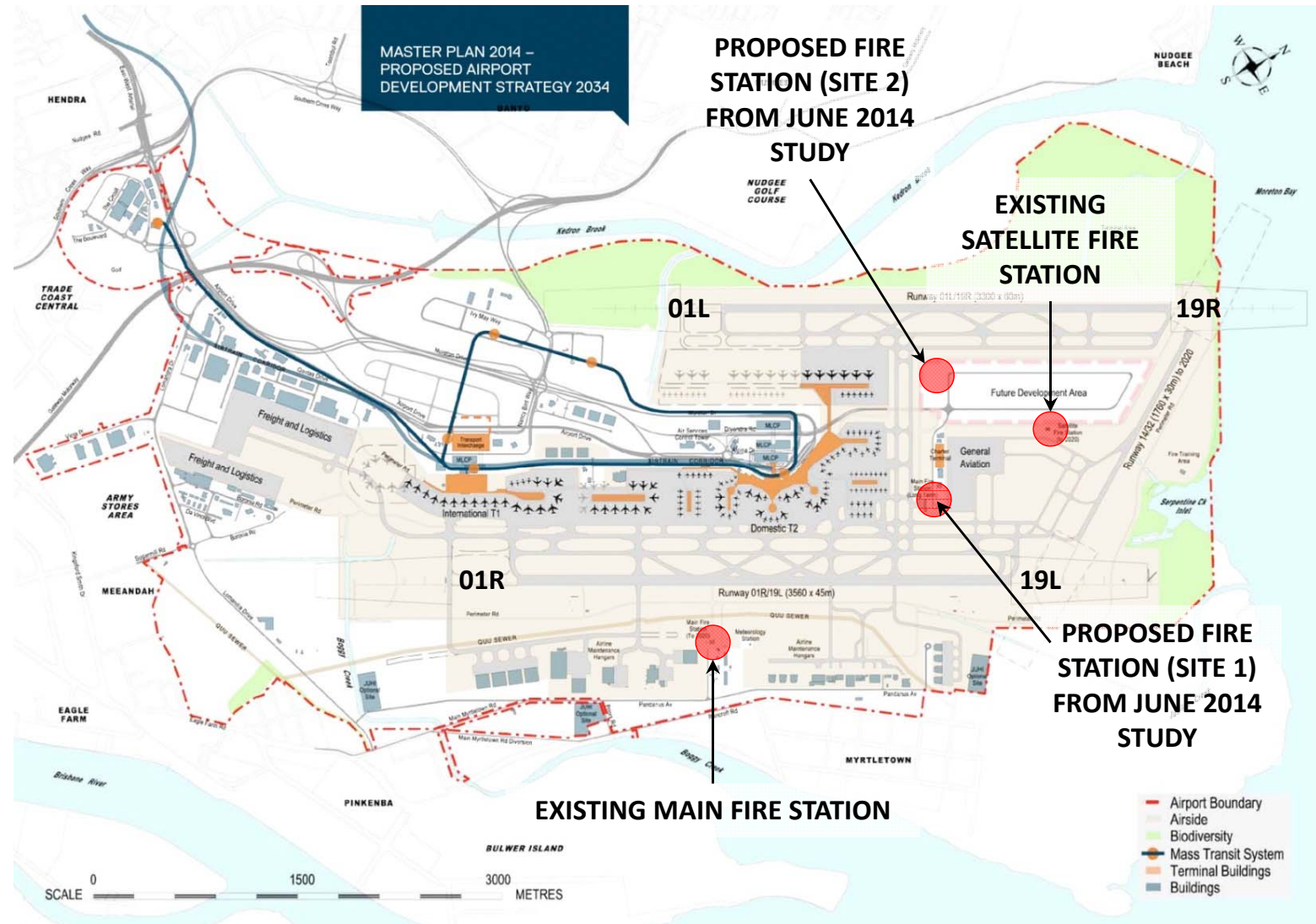
- *Primary considerations:*
 - *The shortest response route to high risk areas (aircraft incidents)*
 - *Direct access to the runway*
 - *Least amount of turns on the response route*
 - *Line of sight visibility from FCC(s)*
 - *Future airport growth / development (ensure sufficient land footprint for any potential future expansion of ARFF service)*
- *Secondary considerations:*
 - *Airside / landside access (e.g. for staff access and landside emergency response)*
 - *Availability of utilities*

ARFF ASSESSMENT AIRPORT MASTER PLAN UPDATE – 2034

The Brisbane Airport 2014 Master Plan – Proposed Airport Development Strategy 2034 illustrated here shows the location of the existing main fire station, existing satellite fire station and the proposed (recommended) fire station from the Airbiz study in June 2014 (labelled as Site 1).

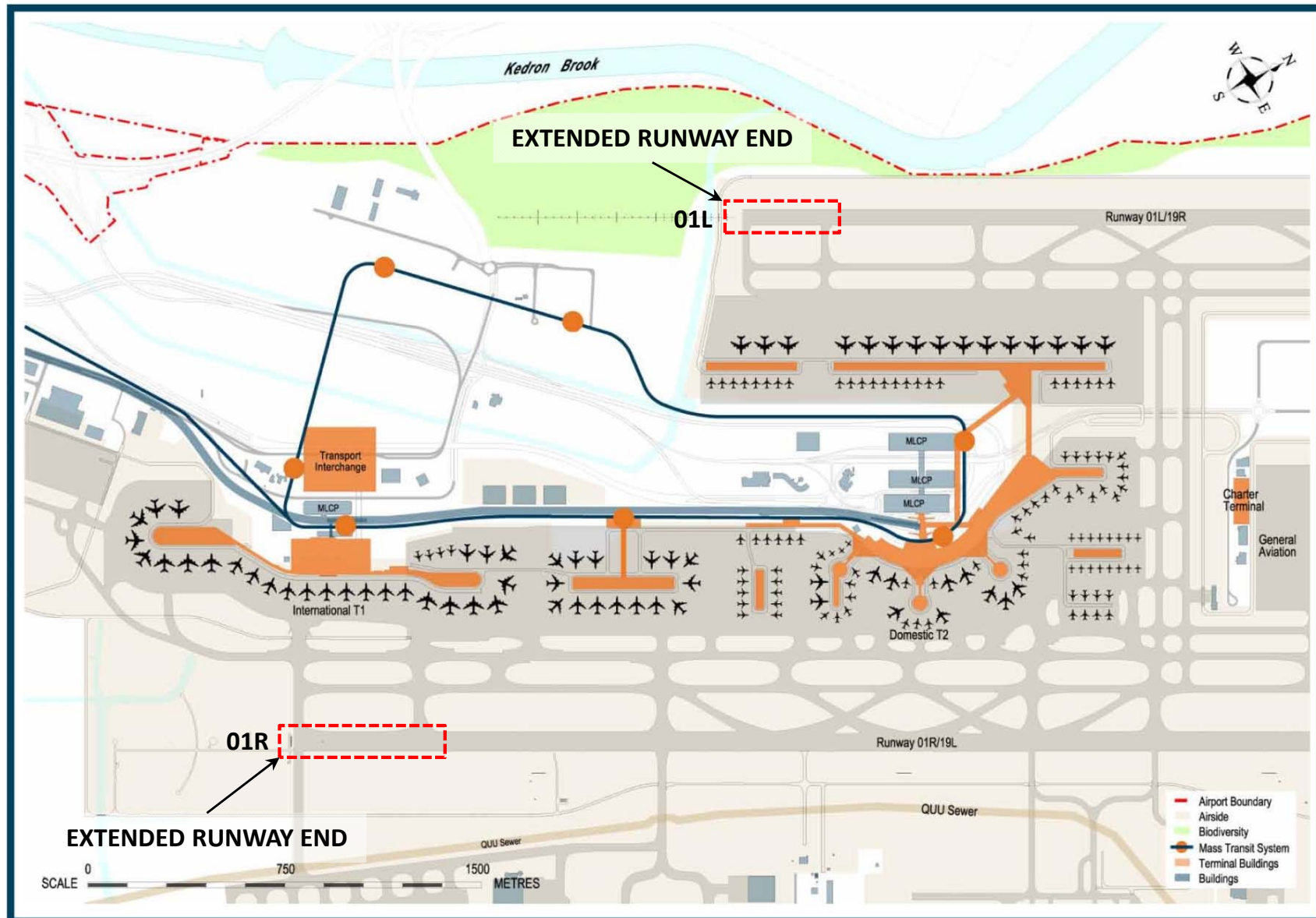
The existing satellite fire station location has not been considered in this report as it currently services Runway 14/32 which will be decommissioned by 2020. This location will not satisfy the criteria for the new parallel runway and does not fit in with long term development plans.

The following two slides provide the 2 Master Plan Options that were developed by BAC (including possible long term runway extensions).



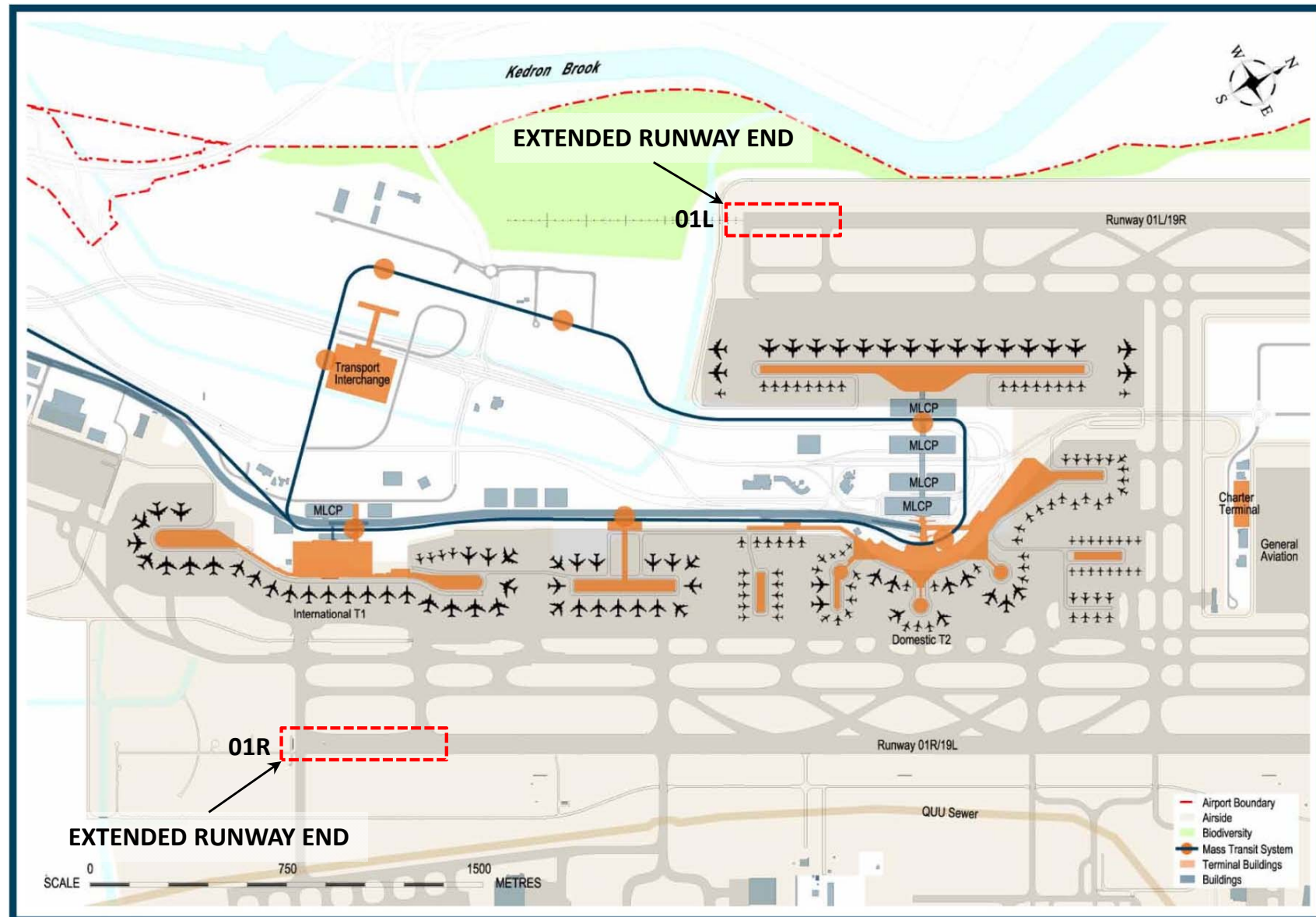
ARFF ASSESSMENT

AIRPORT MASTER PLAN UPDATE – ULTIMATE OPTION 1



ARFF ASSESSMENT

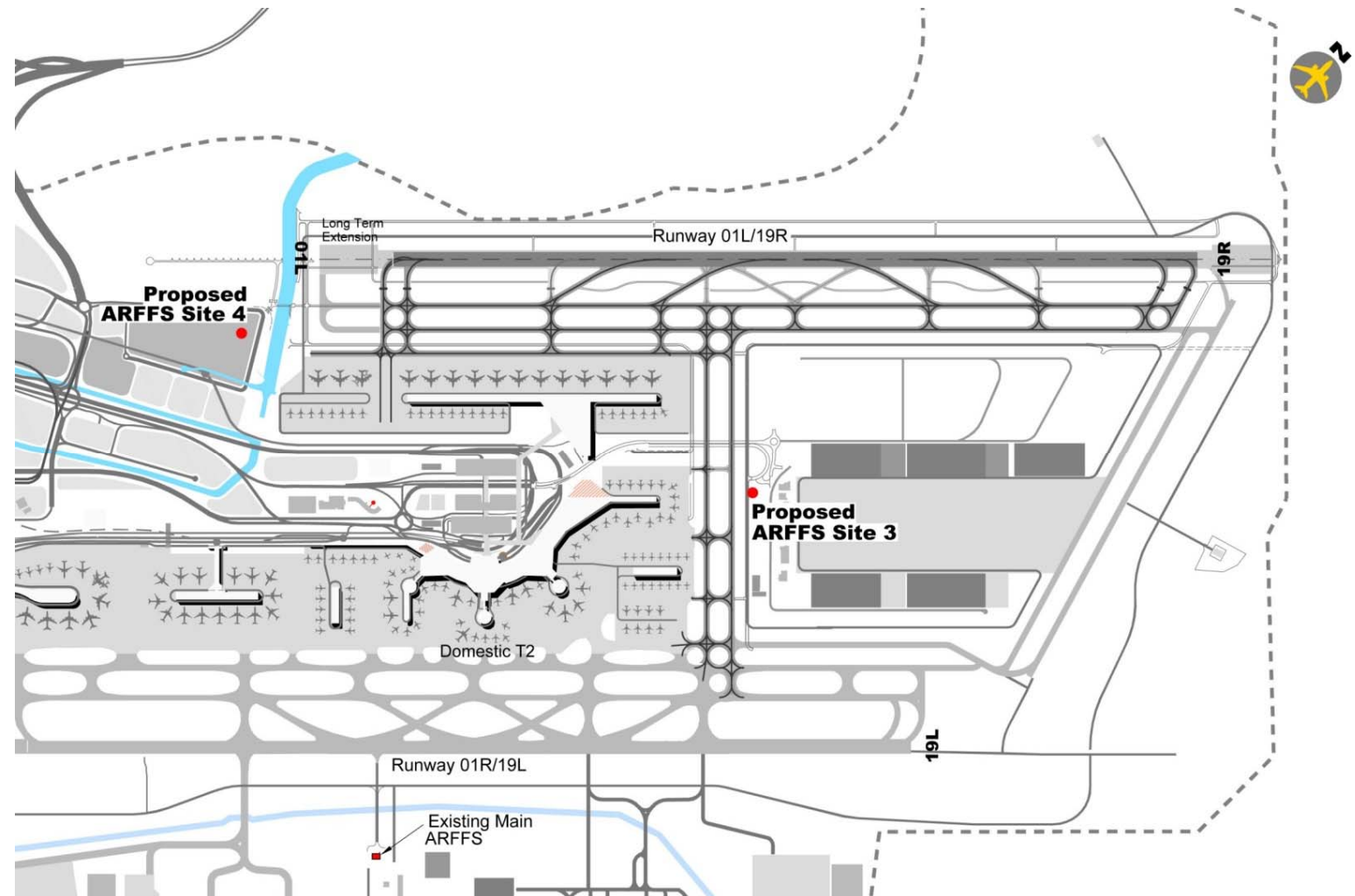
AIRPORT MASTER PLAN UPDATE – ULTIMATE OPTION 2



ARFF ASSESSMENT PROPOSED ARFF SITES 3 & 4

The two new sites requested by Airservices to be assessed are illustrated and identified as Sites 3 and 4 (considering the original sites investigated in June 2014 were identified as Sites 1 and 2).

This report provides an assessment of these sites which can potentially meet ARRF criteria.



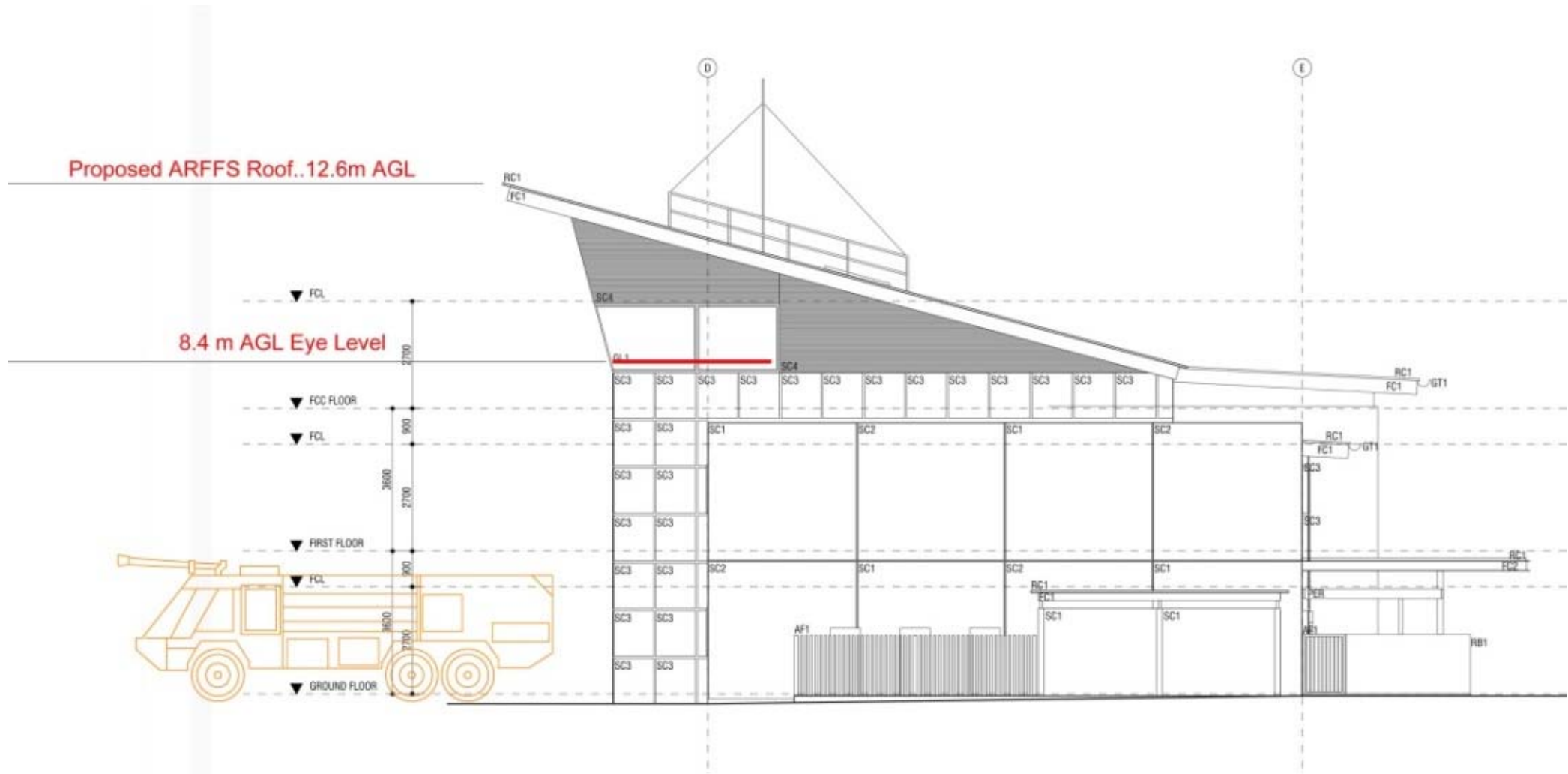
ARFF ASSESSMENT TYPICAL ARFF STATION DESIGN

Airservices advised that the typical ARFF station design to be assumed for Brisbane Airport is the Gladstone/Newman model as shown below. This station design incorporates a Fire Control Centre (FCC) tower located on the second floor of the building with an approximate eye level of **8.4m AGL** and a peak roof height of **12.6m AGL** as shown on the building elevation on the following slide.

Whilst the category of ARFFS for Brisbane may require a bigger facility, the same FCC height is used for this assessment.



ARFF ASSESSMENT TYPICAL ARFF STATION DESIGN



ARFF ASSESSMENT

RESPONSE TIME AND LINE OF SIGHT CRITERIA

CASA MoS Part 139H – Section 6.1 sets out the following response time requirements for a proposed ARFF facility:

- The operational directive of the ARFFS must be to achieve response times not exceeding three minutes to the end of each runway in optimum visibility and surface conditions
- The operational objective of the ARFFS is to achieve a two minute response time to the end of each runway
- The operational objective of the ARFFS is to achieve a response time not exceeding three minutes to any part of the movement area
- Response times for all vehicles must be documented for validation.

Note: Optimum visibility and surface conditions are defined as: day time, good visibility, no precipitation, with normal response route free from surface contamination; i.e. water, ice or snow.

CASA MoS Part 139H – Section 22.1 outlines the Fire Control Centre siting requirements for a proposed ARFF facility which states:

“Where a new FCC is provided the control cabin must provide clear vision of the runway and ‘short final’ approaches. This may require the elevation of the FCC cabin”.

An assessment of the FCC to achieve line of sight to each runway and short final approach (based on at least 300m beyond the threshold) is provided in this report.

ARFF ASSESSMENT

VEHICLE PERFORMANCE STANDARDS AND ASSUMPTIONS

The performance standards and assumptions used for this assessment is provided as follows:

- Response preparedness time (time from raising alarm until the first vehicle leaves the facility) – **45 seconds**
- Time for vehicles to accelerate to 80 km/h – **30 seconds**
- Continue acceleration at the same rate until cruise speed of 110 km/h reached
- Cruise speed – **110 km/h**
- Decelerate from cruise speed to stop at scene of incident – **10 seconds**



Note: The vehicle performance standards and assumptions used in this report were advised by Airservices Australia on 1st November 2013.

ARFF ASSESSMENT RESPONSE TIME ANALYSIS

Based on the proposed routes indicated on the following response time drawings and the MoS Part 139H criteria, the response times (in seconds) from the proposed ARFFS sites to the proposed runway ends at Brisbane Airport are listed on the table below.

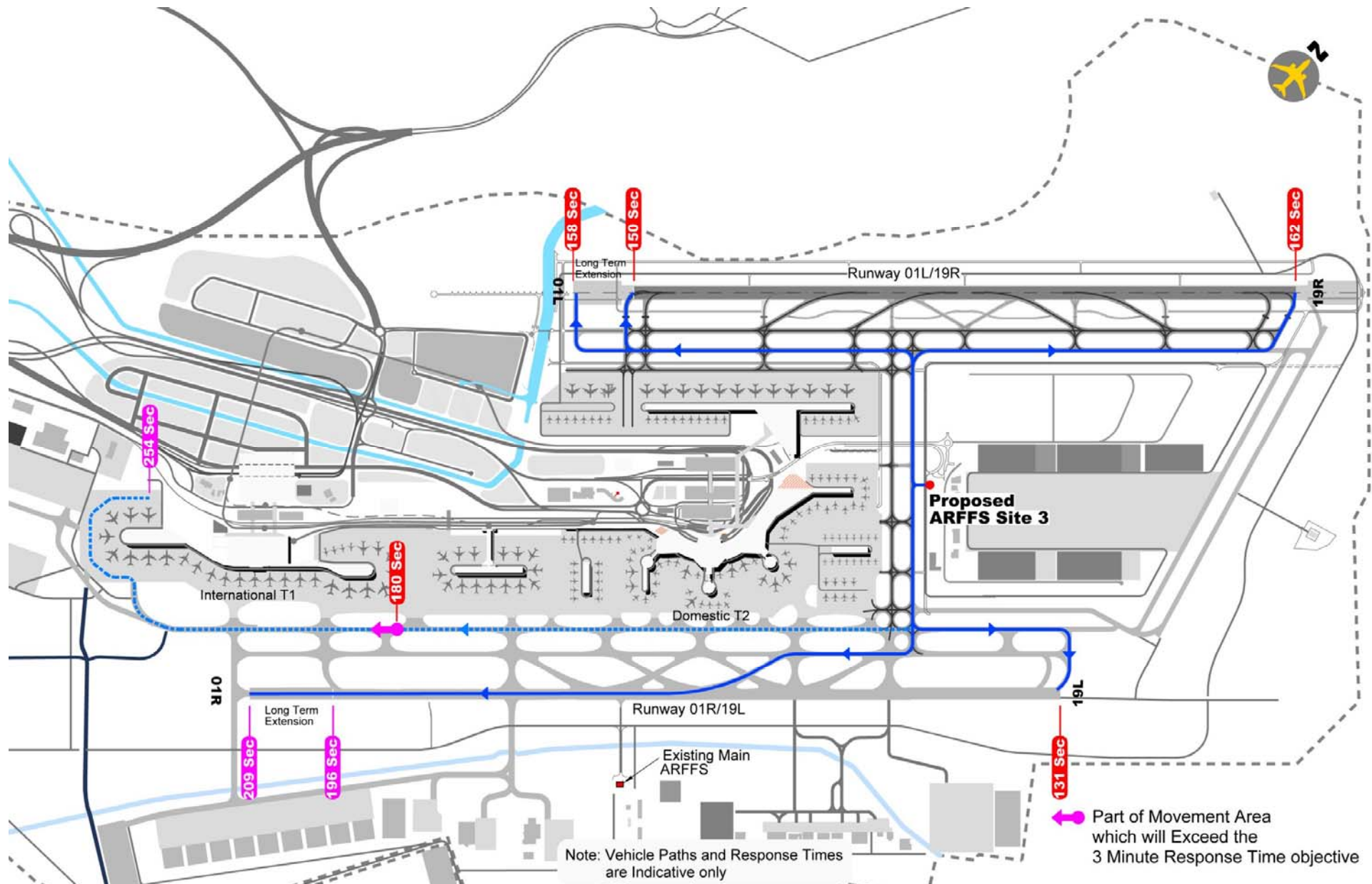
The **green** figures are within the 2 minute operational objective. The **red** figures exceed the 2 minute and the bold **magenta** figures exceed the 3 minute requirement.

The following drawings illustrate the location of each ARFF site and includes:

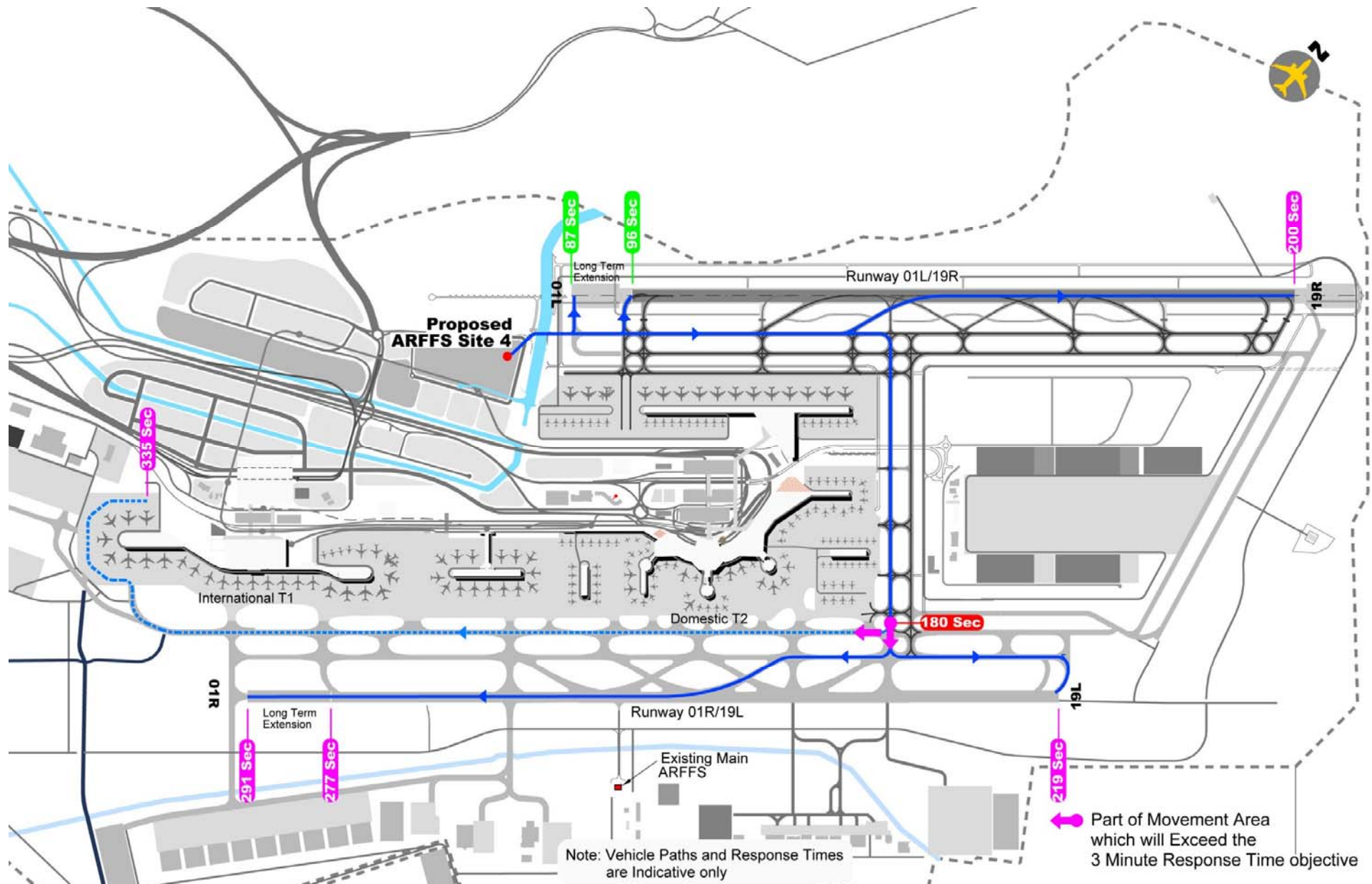
- The associated routes to proposed runway ends from the proposed sites
- The response times to proposed runway ends from the proposed sites

RWY END	PROPOSED SITE 3 (sec)	PROPOSED SITE 4 (sec)
01L	150	96
01L (Extension))	158	87
19R	162	200
19L	131	219
01R	196	277
01R (Extension)	209	291

RESPONSE TIME ANALYSIS SITE 3



RESPONSE TIME ANALYSIS SITE 4



ARFF ASSESSMENT

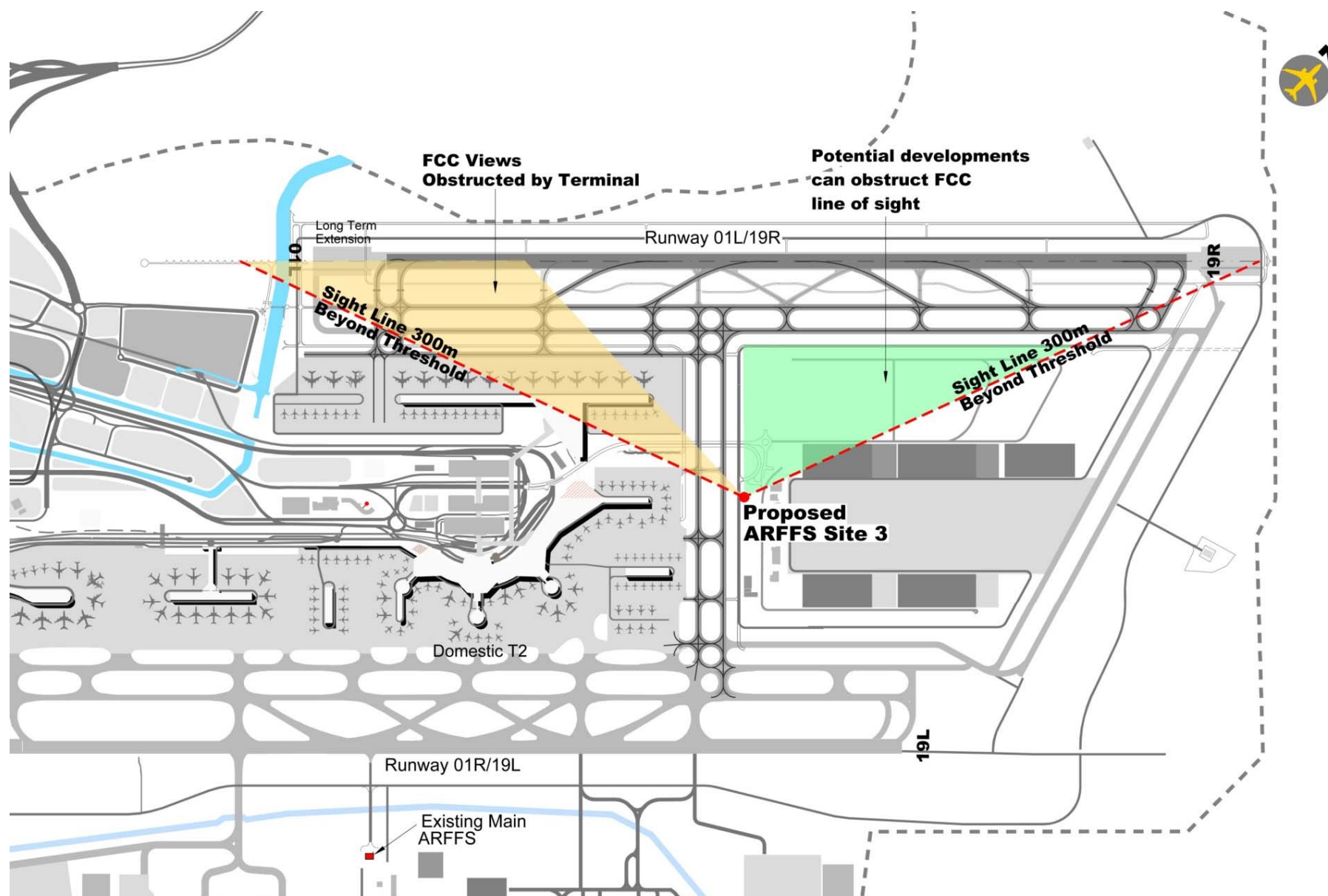
FCC VIEWING TOWER SIGHT LINES

A summary of the line of sight obstructions from the FCC at each site to the relevant runway ends and short final approaches is provided below and are also illustrated on the following slides.

It should be noted that due to the roof design of the FCC tower, potential lines of sight would be dictated by the orientation of the fire station. Views toward the rear of the fire station (landside entrance) would not be possible from the FCC as the roof slopes to the rear (as illustrated by the building elevation on page 10). Modification to the FCC tower design would be needed if 360° views were required.

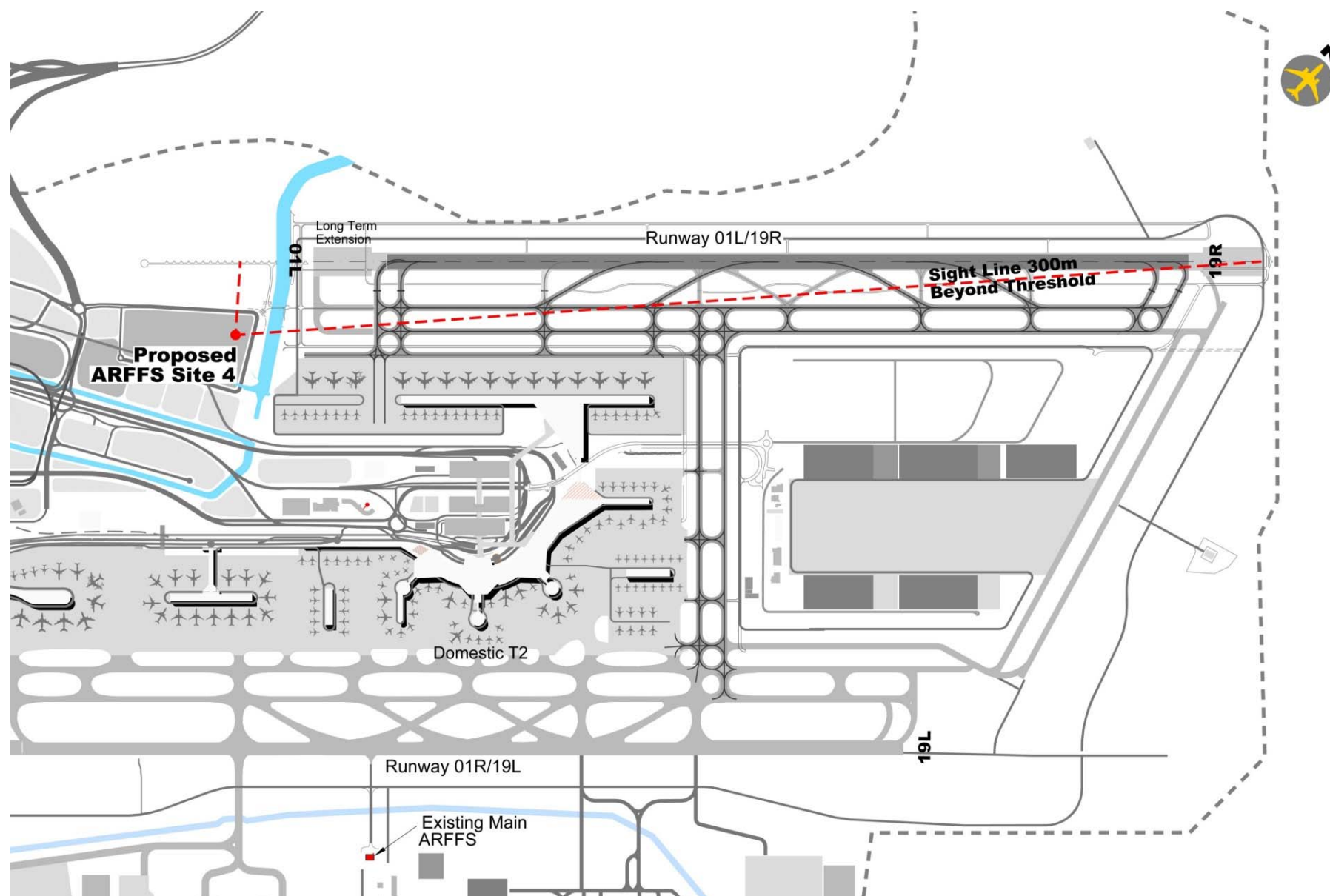
LOCATION	VIEW TO	COMMENTS
SITE 3	Runway 01L	Obstruction of views by future Western Terminal building (shown as orange shaded area). The FCC eye level would need to be 34.5m above ground level (AGL) to provide clear view to the runway. It should be noted that the Western Terminal building is planned beyond (at least) 2035. Without the Western Terminal, the FCC eye level is reduced to the standard 8.4m AGL.
	Runway 19R	Potential obstruction of views by future developments within the Future Aviation Facilities Area (FAFA) . The heights of buildings in close proximity and north of the proposed ARFFS (as indicated within the green shaded area) would need to be below the FCC line of sight.
SITE 4	Runway 01L	No obstruction of views
	Runway 19R	No obstruction of views

FCC VIEWING TOWER SIGHT LINES SITE 3



FCC VIEWING TOWER SIGHT LINES

SITE 4



ARFF ASSESSMENT

OBSTACLE LIMITATION SURFACES (OLS) IMPACT

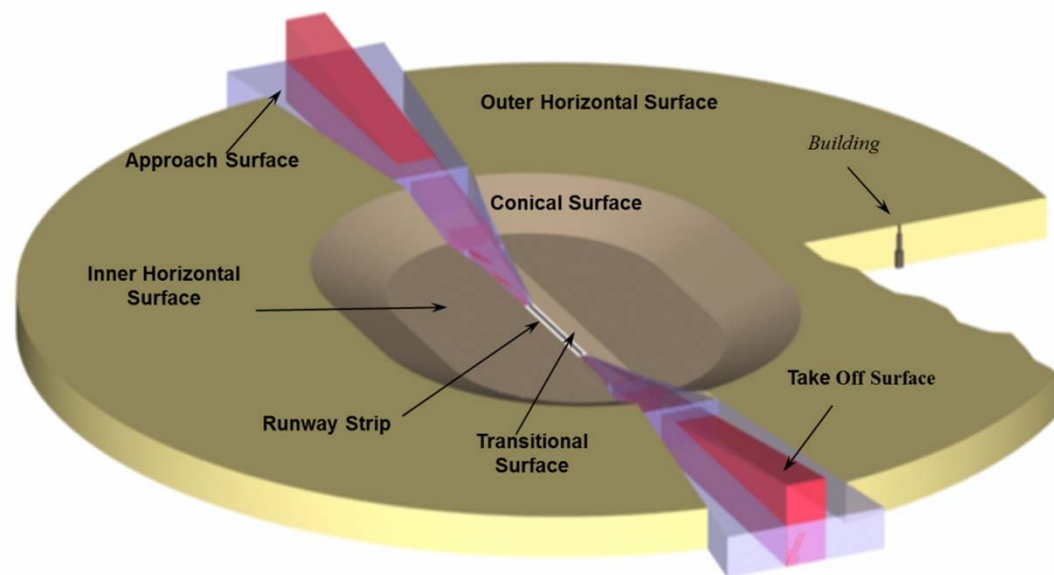
The OLS is a protected surface associated with aircraft approaching the runway. The transitional surface commences from the edge of the runway strip width and slopes upward and outward at 1 in 7 up to the inner horizontal surface which is typically set at 45m above the aerodrome datum. New facilities need to be planned so that they do not penetrate these surfaces.

The following drawing provides a snapshot of the OLS transitional surfaces based on a 300m strip width for the New Parallel Runway (NPR) and the inner horizontal surface level of RL 47.5m AHD based on the airport reference datum of RL 2.5m AHD.

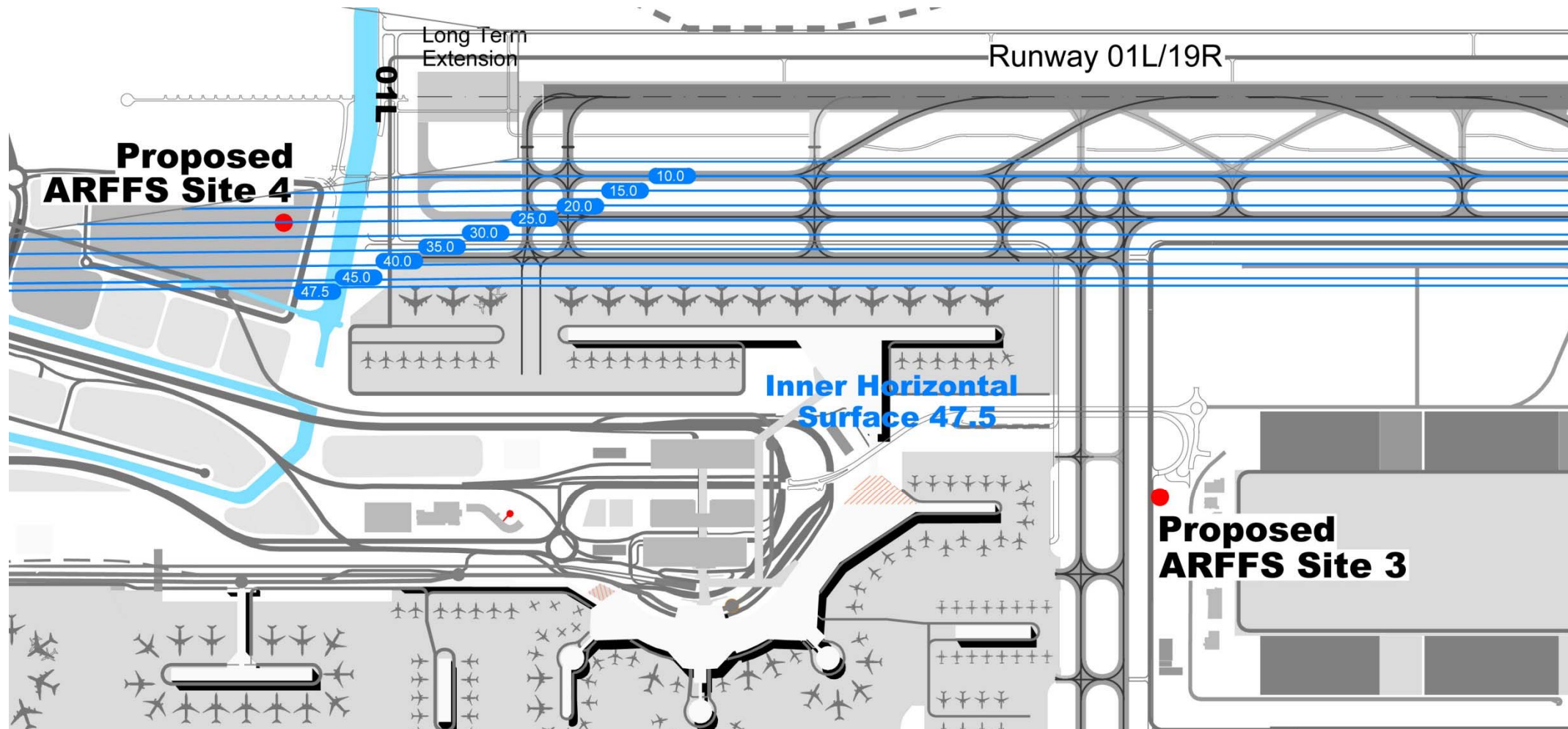
The OLS height limit at each Site are as follows:

- Site 3 - RL 47.5m AHD
- Site 4 - RL 20.0m AHD

The planned ARFFS roof heights for each of the two sites are lower than the obstacle limitation surface and therefore there will be no negative impact on the OLS caused by either ARFF site location.



ARFF ASSESSMENT OBSTACLE LIMITATION SURFACES (OLS) IMPACT



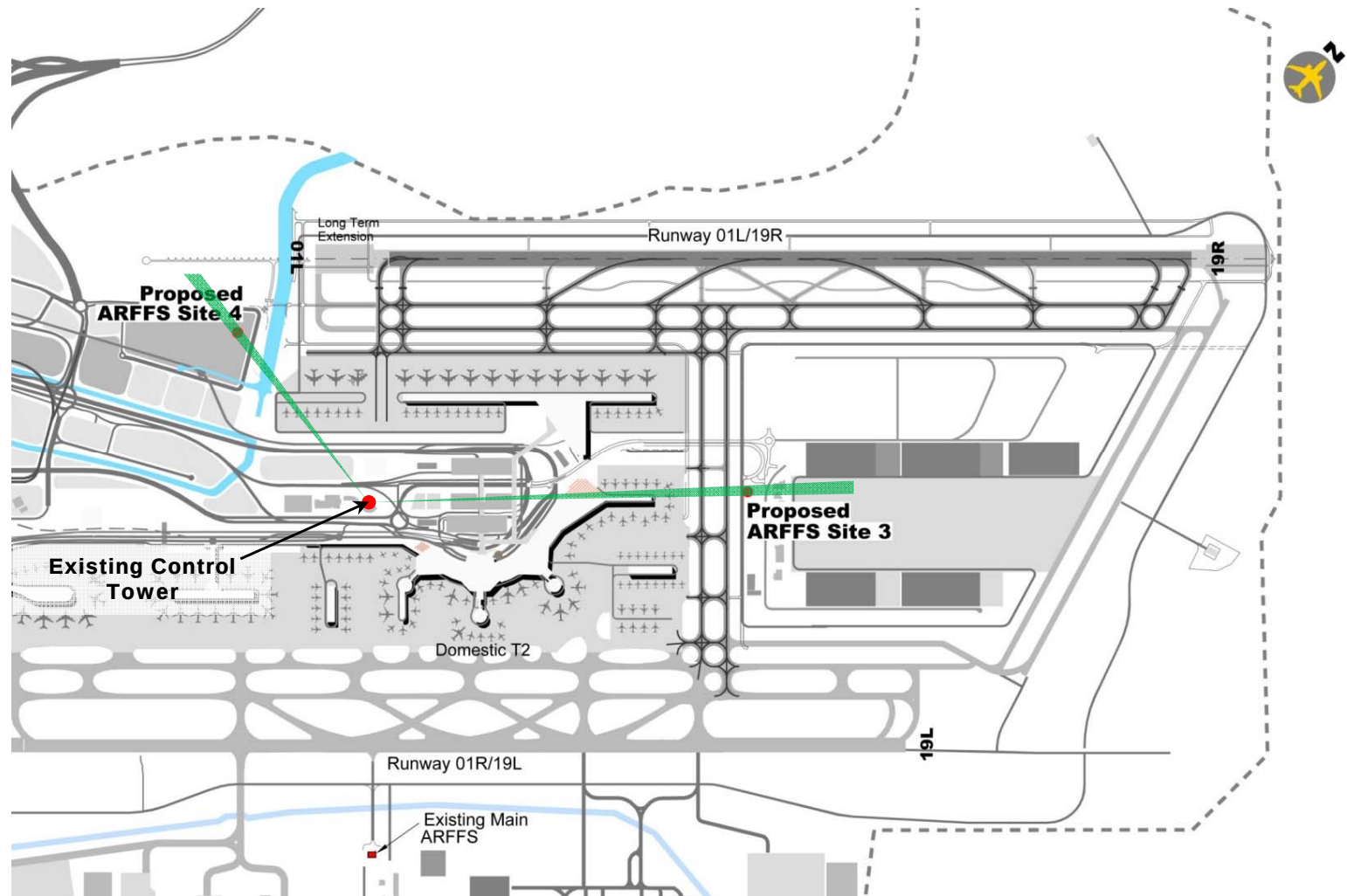
Note: OLS levels shown are in Australian Height Datum (AHD)

ARFF ASSESSMENT EXISTING CONTROL TOWER SIGHT LINES

The sight lines from the existing control tower to the runways and taxiways were assessed for potential obstruction by the proposed ARFF stations at Sites 3 and 4, as shown on the drawing below. The existing control tower has an eye level height of 68.7m AHD.

At Site 3, ATC will be able to see the ground level over the ARFFS roof, some 500m north of the ARFFS. The impact on ATC is very minor as it is restricted to the shadow cast by the width of the ARFFS facility and therefore could be overcome by use of CCTV to cover any black spot, if required.

At Site 4, ATC will be able to see over the ARFFS roof to the ground level of the extended Runway centreline south of Runway 01L



ARFF ASSESSMENT

AIRSIDE / LANDSIDE ACCESS AND UTILITY SERVICES

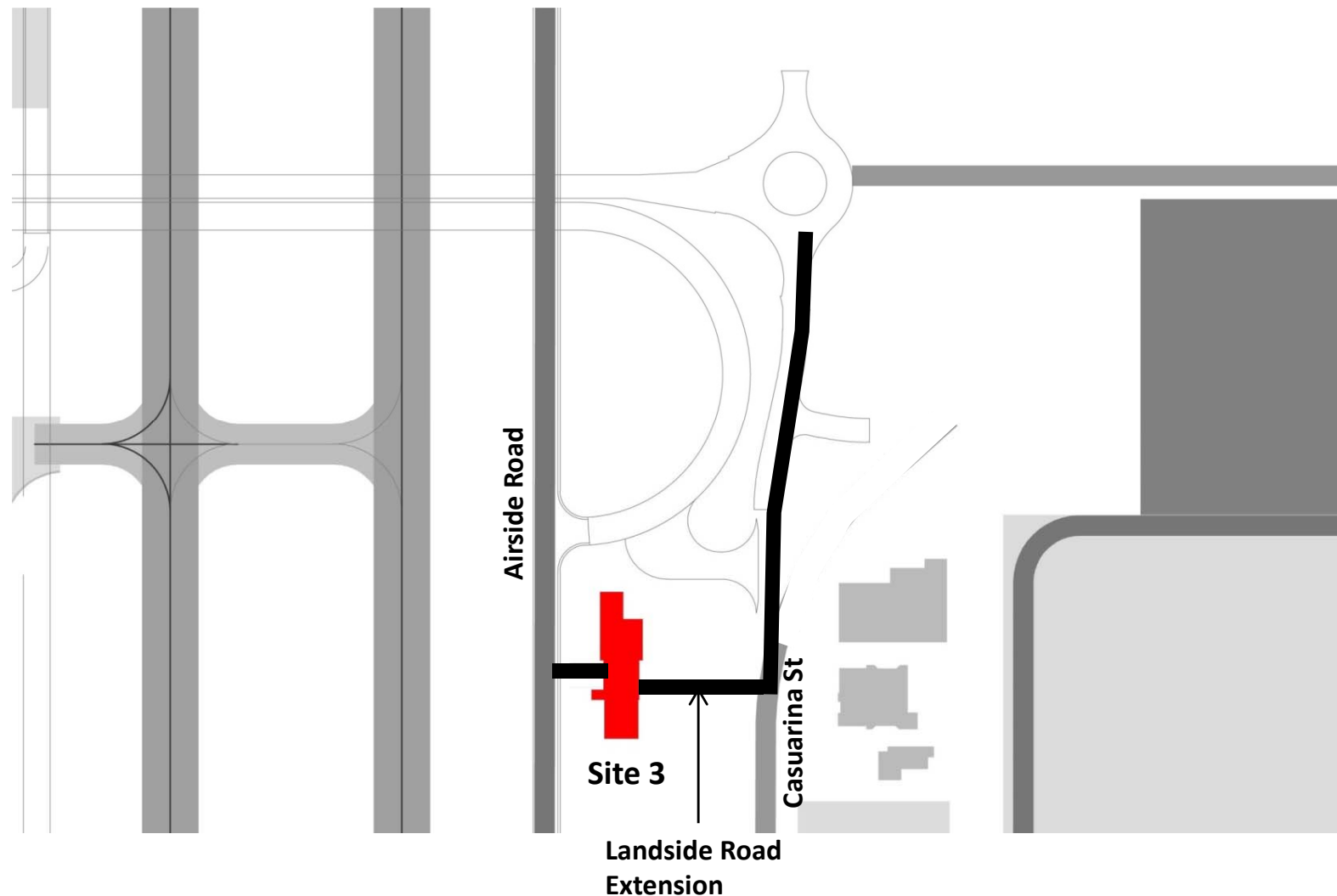
The table below provides a summary of the key access and utility service requirements for each site:

LOCATION	AIRSIDE / LANDSIDE ACCESS	UTILITY SERVICES
SITE 3	• Landside access is available via an extension Casuarina St (adjacent to existing charter terminal) • Minimal dedicated airside road access required due to proximity to future taxiways	• Minor extension of utility services from GA precinct area
SITE 4	• Landside access is available via an extension of Bert Hinkler Drive • Can connect to dedicated airside road access via bridge over Kedron Brook Floodway Drain as this is required as part of NPR works to meet CASA MoS139 requirements (providing access 1,000m south of the 01L threshold)	• Extension of utility services from Bert Hinkler Drive required

ARFF ASSESSMENT

SITE 3 - AIRSIDE / LANDSIDE ACCESS AND UTILITY SERVICES

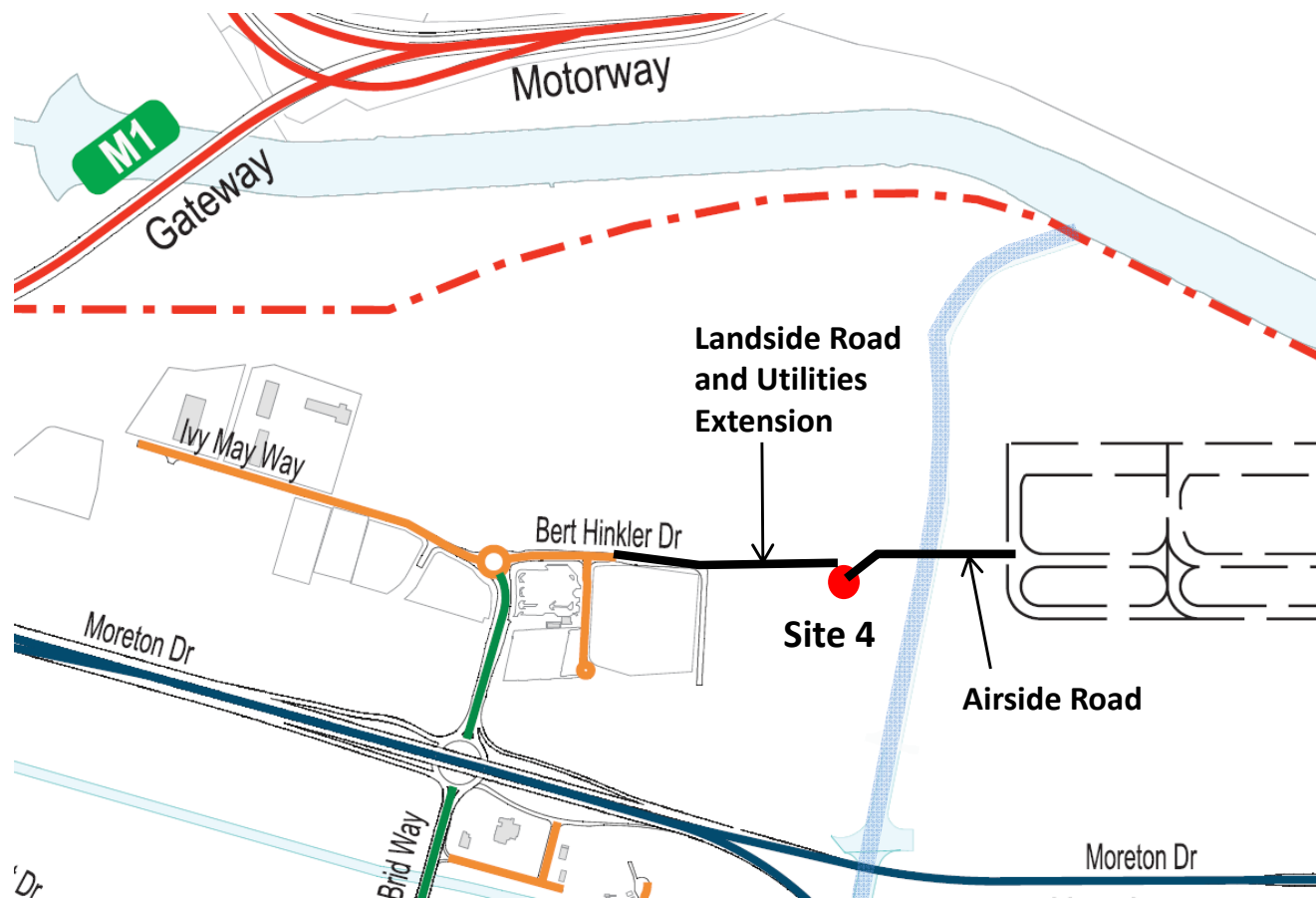
The illustration below shows the future road and utility service extensions required for Site 3



ARFF ASSESSMENT

SITE 4 - AIRSIDE / LANDSIDE ACCESS AND UTILITY SERVICES

The illustration below shows the future road and utility service extensions required for Site 4



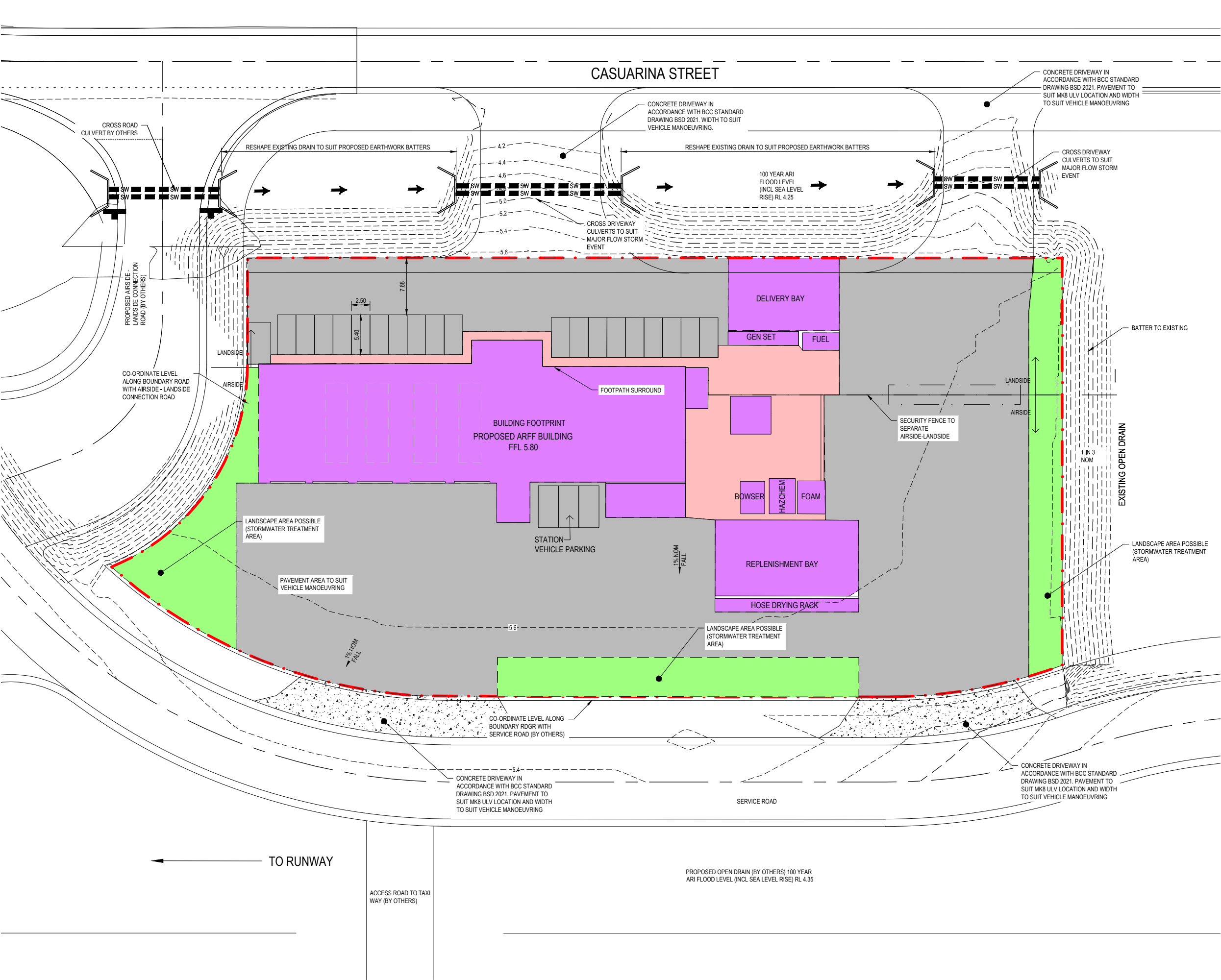
ARFF ASSESSMENT

CONCLUSION AND RECOMMENDATION

In conclusion, for the establishment of the NPR, it is recommended that Airservices discuss the timing of the future Western Terminal. If the timing is to be greater than the design life of the future ARFFS, then it is recommended to provide the proposed ARFFS from Site 3 in conjunction with the existing ARFF site. This will enable operational coverage to all runway ends to be maintained. A combination of reasonable response times (albeit over 2 minutes but less than 3 minutes) and unobstructed lines of sight supports this conclusion.

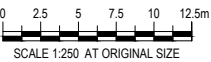
For Site 3, the heights of future developments within the FAFA area and in close proximity (as described on Slide 17) and north of the proposed ARFFS would need to be below the FCC line of sight.

Attachment B: Airservices Australia, Brisbane New Parallel Runway Works - Submission 1



- NOTES:**
1. ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE.
 2. FOR ARFF BUILDING LAYOUT REFER TO ARCHITECTURAL DRAWINGS.
 3. PRELIMINARY CIVIL WORKS LAYOUT TO BE CONFIRMED AT DESIGN STAGE AND CO-ORDINATED WITH ADJACENT WORKS UNDERTAKEN BY OTHERS.
 4. ALL CIVIL WORKS ARE TO BE DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF AIR SERVICES AUSTRALIA AND BRISBANE AIRPORT CORPORATION.

- LEGEND**
- PRELIMINARY DESIGN CONTOURS
 - BUILDING AREA
 - PAVED AREA
 - CONCRETE / FOOTPATH AREA
 - LANDSCAPED AREA



PRELIMINARY

rev	description	app'd	date
A	FINAL SUBMISSION		

AIR SERVICES AUSTRALIA
NEW ARFF FIRE STATION

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